

```
g = 9.8;  
l = 0.5;
```

```
f = @(t, x) [x(2); -g * sin(x(1)) / l];
```

```
f(0, [0; 1])
```

```
ans = 2x1  
     1  
     0
```

```
wn = sqrt(g / l)
```

```
wn = 4.4272
```

```
tn = 2 * pi / wn
```

```
tn = 1.4192
```

```
theta_m = deg2rad(170)
```

```
theta_m = 2.9671
```

```
[t, theta] = ode45(f, [0, 4 * tn], [theta_m; 0]);
```

```
figure  
plot(t, theta(:,1))  
hold on  
plot(t, theta_m * cos(wn * t))  
legend("simulation", "equation")
```

